

What is claimed is:

[C001] 1. A fuel cell assembly comprising:

at least one metallic component;

at least one ceramic component; and

a structure disposed between said metallic component and said ceramic component, said structure configured to have a lower stiffness compared to at least one of said metallic component and said ceramic component to accommodate a difference in strain between said metallic component and said ceramic component of said fuel cell assembly.

[C002] 2. The fuel cell assembly according to claim 1, wherein said structure is configured to be a part of said at least one metallic component.

[C003] 3. The fuel cell assembly according to claim 1, wherein said at least one metallic component is an interconnect.

[C004] 4. The fuel cell assembly according to claim 3, wherein said interconnect is one of an anode interconnect and a cathode interconnect.

[C005] 5. The fuel cell assembly according to claim 1, wherein said at least one ceramic component comprises a fuel cell, said fuel cell comprising an anode, a cathode and an electrolyte disposed therebetween.

[C006] 6. The fuel cell assembly according to claim 5, wherein said fuel cell is disposed on said interconnect.

[C007] 7. The fuel cell assembly according to claim 1, wherein said at least one ceramic component comprises a solid oxide fuel cell.

[C008] 8. The fuel cell assembly according to claim 1, wherein said strain is developed due to thermal expansion.

[C009] 9. The fuel cell assembly according to claim 1, wherein thermal coefficients of expansion of said metallic component and said ceramic component are different.

[C010] 10. A fuel cell assembly comprising:

at least one hollow manifold comprising a wall extending between a first end and a second end, said wall defining a chamber therein, said wall comprising at least one opening extending therethrough in flow communication with said chamber; and

a fuel cell comprising an anode, a cathode and an electrolyte disposed therebetween, said fuel cell disposed on said wall;

wherein a portion of said wall immediately adjacent to said fuel cell is configured to have a lower stiffness compared to at least one of said fuel cell and said wall to accommodate a strain between said fuel cell and said wall.

[C011] 11. The fuel cell assembly according to claim 10, wherein said fuel cell comprises a ceramic material and said wall comprises a metal.

[C012] 12. The fuel cell assembly in accordance with claim 10, wherein said wall in said hollow manifold further comprises a top wall, a bottom wall, and a plurality of sidewalls, said plurality of sidewalls extending substantially perpendicularly between said top wall and said bottom wall, said manifold opening extending through said top wall.

[C013] 13. The fuel cell assembly in accordance with claim 10, wherein said at least one hollow manifold further comprises an electrically conductive material.

[C014] 14. The fuel cell assembly in accordance with claim 10, wherein said fuel cell is bonded directly to said at least one hollow manifold.

[C015] 15. The fuel cell assembly according to claim 10, wherein said fuel cell is selected from the group consisting of solid oxide fuel cell, proton exchange membrane fuel cell, molten carbonate fuel cell, phosphoric acid fuel cell, alkaline fuel

cell, direct methanol fuel cell, regenerative fuel cell, zinc air fuel cell, and protonic ceramic fuel cell.

[C016] 16. The fuel cell assembly according to claim 10, wherein said fuel cell is a solid oxide fuel cell.

[C017] 17. The fuel cell assembly according to claim 10, wherein said strain is developed due to thermal expansion.

[C018] 18. The fuel cell assembly according to claim 10, wherein thermal coefficient of expansion of said fuel cell and said wall are different.

[C019] 19. A fuel cell stack comprising:

a first fuel cell assembly and a second fuel cell assembly electrically coupled together such that at least one sealed passage extends between said first and said second fuel cell assemblies, said first and second fuel cell assembly each comprising:

at least one hollow manifold comprising a wall extending between a first end and a second end, said wall defining a chamber therein, said wall comprising at least one opening extending therethrough in flow communication with said chamber; and

a fuel cell comprising an anode, a cathode and an electrolyte disposed therebetween, said fuel cell disposed on said wall;

wherein a portion of said wall immediately adjacent to said fuel cell and said sealed passage are configured to have lower stiffness compared to at least one of said fuel cell and said sealed passage to accommodate a strain between said fuel cell, said wall and said sealed passage.

[C020] 20. The fuel cell stack accordingly to claim 19 further comprising a cathode flow channel coupled to said at least one hollow manifold of said first fuel cell assembly and said second fuel cell assembly, said cathode flow channel configured

for directing an oxidant between said first fuel cell assembly and said second fuel cell assembly.

[C021] 21. The fuel cell stack in accordance with claim 19, wherein said at least one hollow manifold for said first fuel cell assembly and said second fuel cell assembly is substantially rectangular.

[C022] 22. The fuel cell stack in accordance with claim 19, wherein said at least one hollow manifold of said first fuel cell assembly and said second fuel cell assembly further comprises an electrically conductive material.

[C023] 23. The fuel cell stack according to claim 19, wherein said fuel cell is selected from the group consisting of solid oxide fuel cell, proton exchange membrane fuel cell, molten carbonate fuel cell, phosphoric acid fuel cell, alkaline fuel cell, direct methanol fuel cell, regenerative fuel cell, zinc air fuel cell, and protonic ceramic fuel cell.

[C024] 24. The fuel cell stack according to claim 19, wherein said fuel cell comprises a solid oxide fuel cell.

[C025] 25. The fuel stack according to claim 19, wherein said strain is developed due to thermal expansion.

[C026] 26. The fuel cell stack according to claim 19, wherein thermal coefficients of expansion of said fuel cell and said top wall are different.

[C027] 27. A fuel cell assembly comprising:

a first component comprising a first material;

a second component comprising a second material; and

a structure disposed between said first component and said second component to accommodate a strain therebetween;

wherein a coefficient of thermal expansion of said first component is greater than a coefficient of thermal expansion of said second component.

[C028] 28. The fuel cell assembly according to claim 27, wherein said first component is an interconnect and said first material comprises a metal.

[C029] 29. The fuel cell assembly according to claim 27, wherein said second component is one of an anode and a cathode and said second material comprises a ceramic.